Bureau of Business Research
Graduate School of Business Administration
University of Michigan

May, 1970

CONCENTRATION AND COMPETITION IN THE EUROPEAN AUTOMOBILE INDUSTRY

Working Paper No. 39

by

Dr. Ing. Bruno Hake
Wiesbaden, Germany

BACKGROUND OF THIS PAPER

The purpose of this paper is to provide the Bureau of Business Research of the University of Michigan with information on the concentration and competition in the Western European automobile industry, focusing on those developments which relate to consumer benefits to provide background data for the Bureau's project on Evolving Competitive Aspects in Major Industries.

This paper is primarily a summary of an extensive study conducted by Professor Harald Jürgensen and Dr. Hartmut Berg of the Institute for European Economic Policy of the University of Hamburg on Concentration and Competition in the European Economic Community -- the Example of the Automobile Industry, published by van de Hoeck & Ruprecht at Göttingen in 1968. Other sources for this paper were:

"The Changing Structure of the European Automobile Industry," paper presented to the business press in 1966 by the Association of German Automobile Manufacturers.

"Time of the Giants," series of articles on the European automobile industry by Der Spiegel in 1969.

"The West-European Automobile Industry," by Hanns W. Schwacke, published by Antax Verlag, Frankfurt, 1970.

Concentration in the European Automobile Industry

Production

The European automobile industry experienced a dynamic, almost explosive growth during the postwar period. The prewar level of production was exceeded in most countries by 1950, and production continued to grow rapidly throughout the period from 1950 to 1970.

The formation of the European Economic Community (EEC) and the European Free Trade Association (EFTA) provided a strong impetus for automobile production in Europe. The effect was a rapid increase of intracountry automobile trade within each group. While automobile sales in the EEC increased by more than 132 per cent between 1958 and 1965, trade between the countries of the group increased by over 295 per cent, more than twice the first amount. The development was similar in the EFTA: automobile sales in EFTA countries increased by more than 46 per cent from 1960 to 1965, whereas intercountry trade between EFTA members increased by more than 135 per cent.

The automobile trade between the two blocks, however, remained virtually unchanged. EEC car makers increased their market share in EFTA countries from 25.5 per cent in 1958 to 27.7 per cent in 1965. EFTA car producers obtained an EEC market share of 1.5 per cent in 1958 and 3.2 per cent in 1965. The share of

automobile exports by German and Italian producers increased rapidly, while France and England lost their once dominant position as European automobile exporters.

But the most significant development after 1958 was the growing integration of the automobile market within the EEC and EFTA. This increased competition in each country, and thereby offered to the consumers a wider choice of car models. In Germany, for example, the market share of imported automobiles, primarily from France and Italy, passed the 20 per cent mark in 1968. The development of imports was similar in other EEC countries.

Despite the rapid increase of automotive production, the car density in Western Europe, measured in population per car, is still relatively low compared with the United States. While car density in the United States reached 6.6 people per car in the twenties, this density was not reached in Western Europe until 1969. However, the density is significantly higher in the industrialized countries -- especially in France, Great Britain, and Germany -- where it reached 4.5 to 5.1 people per car in 1969.

The most significant data concerning European automobile production are reported in Table 1.

Concentration in the automobile industry

The history of automobile production is characterized by increased concentration. It is estimated that about 4, 100 companies

TABLE 1

The Production of Passenger Cars in Western Europe
(Shares in Percentages)

Country	1950	1955	1960	1965	1969
West Germany	19.8	30.3	35.7	36.5	35.2
France	23.2	23.0	22.8	18.2	22.4
Italy	9.1	9.2	11.1	14.5	15.3
Holland	...	...	0.3	0.4	0.6
Belgium	...	...	...	2.3	3.0
Total EEC	52.1	62.5	69.9	71.9	76.5
Great Britian	47.0	35.7	26.7	23.0	17.8
Sweden	0.9	1.3	2.1	2.5	2.5
Austria	...	0.4	0.3	...	...
Total EFTA	47.9	37.4	29.1	25.5	20.3
Spain	...	0.2	0.8	2.1	3.7
Yugoslavia	...	...	0.2	0.5	0.5
Total Western Europe	100.0	100.0	100.0	100.0	100.0
Number of units in million cars	1.1	2.5	5.1	7.5	9.7

in the entire world have been engaged in the production of automobiles since the invention of the gasoline engine in 1852. By 1970 less than 50 of these still survived. Around the turn of this century about 300 brands competed. In 1914 this number had increased to 700, of which 338 brands were sold in the United States.

In Germany there were approximately 100 manufacturers of automobiles in 1920. Between 1920 and 1932 increased domestic competition, the effect of the economic crisis in the thirties, and competition from cheap cars imported from the United States reduced this number by about 80. The first wave of concentration started during the twenties. Benz and Daimler merged in 1926. Four companies -- DKW, Audi, Horch, and Wanderer -- merged into the Auto-Union in 1928.

During the late 1920s, the two large U. S. manufacturers, General Motors and Ford, started production in Europe. General Motors acquired the British automobile manufacturer Vauxhall for $2. 5 million after attempts to acquire Citroen failed. Shortly afterwards, GM manager Alfred Sloan traveled to Rüsselsheim and acquired Adam Opel for $33 million in 1929.

Henry Ford did not follow the acquisition road. He built his own plant at Dagenham near London in 1928 and, with the support of Cologne's mayor, Konrad Adenauer, established a Ford factory at Cologne in 1930.

Twelve German manufacturers survived the Second World War. After the war, the rapid increase of production brought increased competition and high financial requirements. With the exception of DAF (Van Doorne's Automobielfabriek) at Eindhoven, Holland -- the only newcomer to the industry after the war -- no new firms succeeded in establishing themselves in the market. In Germany there were several attempts to enter the field. The aircraft companies Messerschnitt and Heinkel both introduced small cars in the early 1950s. Other companies such as Maico, Gutbrod, Zündapp, and about forty others also tried to enter the small-car field but failed as competition in the low-price market intensified.

After the early 1960s, several well-established firms had to leave the market. Borgward of Bremen, the manufacturer of Hansa, Borgward, Lloyd,and Goliath automobiles, went into bankruptcy in 1961 as the result of frequent model changes which drained its capital and caused a serious profit squeeze. Hans Glas, a postwar newcomer to the industry, sold his manufacturing facilities to BMW in 1967. The reason for Glas' failure was a proliferation of models, which made it impossible for the company to reach the cost benefits of high-production runs.

Auto-Union, formed by a merger of four independent manufacturers in 1928, sold out to Daimler-Benz in 1958 and was acquired by Volkswagen in 1964. NSU, manufacturer of medium and small cars, was acquired by Volkswagen AG in 1969 and merged with Volkswagen's subsidiary, Audi, into Audi-NSU Auto Union AG. These developments

are typical of similar trends in other European countries: the number and importance of small independent manufacturers decreased, while the importance of a few large firms increased.

Mergers and acquisitions are not the only course to concentration. There are also a number of joint ventures by major European automobile manufacturers which are primarily devoted to the cooperative development of new engines for automobiles. These ventures often result in a formal or tacit agreement by the partners involved not to compete in certain market segments.

Volkswagen and Daimler-Benz formed a joint subsidiary, Deutsche Automobile GmbH, to develop new engines. There are also strong ties between Volkswagen and Porsche concerning engineering and sales. Many of Volkswagen's new models were designed by Porsche. Volkswagen, in turn, provides sales and service facilities for Porsche sport cars in many parts of the world.

There are financial ties between Daimler-Benz AG and BMW: the Quandt-group, an important German industrial holding, owns about 15 per cent of Daimler-Benz AG shares and a majority interest in BMW.

There are other ties between Volkswagen (Germany's largest car manufacturer), Citroen (an important French automobile manufacturer), and Fiat. Through its subsidiary, Audi-NSU, Volkswagen owns a 50 per cent interest in Co-Motor, a company formed to develop and produce a new automobile with a Wankel engine. The other 50 per

cent is held by Citroen. Fiat in turn holds a 15 per cent interest in Citroen. Fiat's holdings of Citroen stock were significantly increased in 1970.

In France and England the trend toward concentration has been similar to that in Germany. Chrysler purchased SIMCA in 1962 and acquired the British manufacturer Rootes in 1967. In 1968 the British automobile industry was characterized by a strong concentration movement: Leyland Motor Corporation (Rover and Triumph) and British Motor Holdings (Austin, Jaguar, M. G., Morris, Wolseley, and Riley) merged to form the British Leyland Motor Corporation with 33 manufacturing plants and 200, 000 employees. Fiat, a large and diversified Italian manufacturer which not only produces automobiles and trucks but also locomotives, aircraft, and other industrial and consumer products, acquired the truck manufacturer OM and the automobile manufacturer Autobianchi, after taking a minority interest in Citroen. Fiat also owns a subsidiary in Germany.

The importance of the largest European automobile manufacturing groups is shown in Table 2. In 1965, the eight largest companies or groups accounted for 88. 5 per cent of total automobile and truck production (measured in units). The largest was the group comprised of VW, Auto-Union, and Daimler-Benz, with 1. 7 million units. Second and third were the Fiat and Ford Motor groups, fourth was the General Motors group, and fifth the Renault group.

TABLE 2

The Largest Car and Truck Manufacturers in 1965

Manufacturers and Group	Production (In Thousands of Units) *	Share of Total Production + (Percentage)
Volkswagen	1,363	
Auto Union	52	
Daimler-Benz	174	
Total group	1,589	20.6
Fiat	974	
Autobianchi	33	
Neckar Automobil	15	
OM	...	
Simca Industries	...	
Total group	1,022	13.0
Ford Köln	316	
Ford Genk	164	
Ford Dagenham	505	
Total group	985	13.0
Opel	616	
Vauxhall	227	
Total GM group	838	11.1
Renault France	487	
Renault Spain	39	
Peugeot	267	
Saviem	...	
Total group	793	10.9
British Motor Co. group	630	9.1
Citroen France	360	
Citroen Spain	16	
Panhard	12	
Total group	388	5.7

* Passenger cars only.

\+ Cars and trucks up to six tons total weight.

(continued)

TABLE 2 -- Continued

The Largest Car and Truck Manufacturers in 1965

Manufacturers and Group	Production (In Thousands of Units)*	Share of Total Production + (Percentage)
Simca	237	
Rootes	173	
Total Chrysler group	410	5.2
All groups together	6,660	88.5

* Passenger cars only.

\+ Cars and trucks up to six tons total weight.

Measured by country of ownership, U.S. and Italian companies increased their share of the European automobile market in the 1962-67 period. GM, Ford, and Chrysler increased their share from 22.7 per cent to 29 per cent. Fiat increased its share from 12 per cent to 19.3 per cent. The share of German manufacturers decreased from 17.3 per cent to 12.6 per cent. But in terms of country of production, Germany is the largest automobile manufacturer in Western Europe and the third largest in the world after the United States and Japan.

Evaluation of the Consumer Benefits of Concentration

Cost advantages of manufacturing

An evaluation of the cost benefits obtained by the concentration of automobile manufacturing can be made by using the same considerations used in the Bureau's Working Paper No. 5, "Performance Issues in the Automobile Industry." 1/ The critical stage in plant economies occurs during the production of components and not during the assembly operation. With modern production and manufacturing technology, economies of scale can be enjoyed by European manufacturers who have production runs of 200,000 to 300,000 units per year. Very few additional benefits can be obtained if annual production exceeds 500,000 units.

1/ By Sidney C. Sufrin, H. Paul Root, Roger L. Wright, and Fred R. Kaen, Sept. 1970.

These figures refer to low- and medium-price cars for the mass market. Most new manufacturing plants built in Germany during recent years -- such as Opel's Bochum plant which manufactures Kadett cars, Alfa Romeo's Neapel plant, and Ford's plant at Genk in Belgium -- were built for a capacity of between 250,000 and 300,000 units. Car makers concentrating their production on high-priced cars, however, have demonstrated the profitability of considerably smaller manufacturing operations. Such manufacturers include:

--Porsche: 15,000 cars in 1969

--BMW (Bavarian Motor Works):

140,000 cars in 1969

--Volvo: 182,000 cars in 1969

But these operations are profitable not because of low production costs but rather because of high prices. These manufacturers specialize in high-priced models for a relatively limited market of affluent consumers who are willing and able to pay a premium for cars of superior engineering or styling.

But small manufacturers who compete in the low-price car market either have not been able to survive as independent firms or are facing substantial difficulties. NSU Motorenwerke AG, which produced 127,000 units in 1968, and Van Doorne's Automobielfabriek NV (DAF), which produced 60,000 units in 1969, are examples of such manufacturers. (The break-even point of NSU Motorenwerke was

estimated by its management as 105,000 units.) These companies faced the competition of large firms such as Volkswagen, Opel, Ford, Fiat, and Renault.

The fact that a number of small manufacturers such as NSU, DAF, and others survived through the end of the sixties indicates that the dynamic growth of the European automobile market prevented fierce price competition and kept prices at a high level. Thus small manufacturers could survive while the large firms made very large profits which were used to finance further expansion of production.

NSU was acquired by Volkswagen in 1969, when increased competition in the small-car market forced companies to introduce new models. NSU was unable to finance the high investment required for this model change.

DAF survives because of a clever market strategy: the company manufactures small cars with a special type of automatic drive system. Until recently, it was the only European car maker offering automatic drive on low-priced cars. Therefore, the company can demand a relatively high price for its small cars and thereby offset the high costs of its low-volume production.

Large European manufacturers have an annual production level which makes it economical to use expensive equipment in order to enjoy the benefits of low unit costs. Therefore they can use manufacturing methods which are similar to those employed by the large

U. S. automobile companies. But, contrary to American companies which operate in a market with high labor costs, European manufacturers through the 1960s had the option of employing manufacturing techniques which were less capital-intensive with more labor cost per unit. Because of the relatively low level of labor cost, these methods were economical in Europe. Wages in the U. S. automobile industry amounted to $3.21 per hour; in Germany they were $1.21 per hour in 1964. With rapidly rising labor cost, it can be expected that the minimum production required in the low-price car market will rapidly shift to the level of at least 250,000 units.

Experts expect that radically new manufacturing technology might result in a lower break-even point. The use of plastics instead of steel for body and frame construction could reduce the level of economic production to 60,000 units per year. A similar effect might result from using different power plants such as fuel cells. However, these technologies are not yet available for commercial applications. Therefore, small European manufacturers can only survive if they avoid price competition with the automotive giants by building high-price luxury or sports cars.

Cost economies of assembly plants to cut distribution costs

The Big Three U.S. automobile manufacturers all operate a considerable number of assembly plants in the United States in order to save on the cost of physical distribution. Operating assembly plants for this reason does not play a significant role in Europe because the

distances in Europe are not large enough to make the operation of decentralized assembly plants economical. Most decentralized assembly and parts plants have been established because of the labor shortage in Germany and other European countries, which often made it impossible to expand operations at a centralized plant. Volkswagen and Opel operations in northern Germany and Belgium were built to supply overseas markets from convenient ports at Emden, Brussels, and Antwerp.

Through the 1960s, no single European manufacturer had sales in other EEC countries large enough to justify the operation of assembly plants. But this might change in the 1970s. With increasing integration of the EEC market, Volkswagen might find it economical to assemble cars in northern Italy, and Fiat and Renault to assemble cars in Germany; but they have not yet found it so.

The use of assembly plants is not likely to be a cause for concentration. The optimum size of assembly plants is estimated to be about 25,000 to 50,000 units. Even the medium-size European manufacturers have obtained a volume which would make it possible to operate and finance such relatively small assembly operations if they were needed.

About five years ago American manufacturers with subsidiaries in Europe started to concentrate the manufacture of parts and components for all their European operations in one particular plant. Ford Werke AG, for example, built a new stamping and casting plant at Düren, Germany, to supply its main plants at Cologne, Genk, and Saarlouis with rear axels.

General Motors built a plant at Strasbourg to produce automatic drives for its European subsidiaries. In 1966 Opel built a new plant at Kaiserlautern to produce chassis parts, drive shafts, shock absorbers, and steering gears.

Economies of scale in marketing

Large car manufacturers obtain economies in advertising measured in costs per unit sold. The following are the 1965 expenses for advertising in TV, radio, newspapers, magazines, and movies:

	Total in Millions	Per Unit
Volkswagen	DM 25.3	DM 51.
Ford Werke	13.3	55.
Daimler-Benz	7.3	80.
Adam Opel	24.3	73.
BMW	9.8	281.

This indicates that the large companies have relatively large advertising budgets and lower advertising costs per unit sold. But the competitive disadvantage for the smaller companies is rather limited. Potential customers have and use other channels of communication to obtain information on new cars. Newspapers and other media report in great detail on the technical, styling, price, and operational characteristics of new cars, whether introduced by large or small manufacturers. The typical European consumer is therefore supplied with considerable information on new cars.

Sales folders and demonstrations from the dealer, the opportunity to observe cars on the road, and the test reports on new cars in daily newspapers and magazines are generally considered more significant

criteria for brand selection than media advertising. Therefore, the disadvantages of high advertising costs for small manufacturers cannot be considered significant.

Economies of distribution

A well-financed, properly equipped, and locally respected dealer organization is indispensible to a successful automotive manufacturer. In the United States, it is considered necessary to have 2, 500 to 3, 500 dealers in order to obtain a reasonable penetration of the national market. Edwards and Pashigian report that companies with a sales volume below 600, 000 units could expect substantially higher distribution costs per unit and great difficulties in maintaining adequate dealer organizations in the United States. These statements, however, are undermined by the fact that Volkswagen, generally regarded as having very efficient U. S. distribution, had only about 1, 000 dealers and annual sales of about 450, 000 units in the United States in 1968.

The success of the Volkswagen marketing and service organization in the United States demonstrates that marketing success is primarily a result of making available in important regional markets adequate dealer and service facilities which, in terms of quality, are competitive with those of the major car manufacturers. Mere numbers of dealerships are not a significant criteria for success. It is not necessary to have a dealer in every small town in Bavaria or Sicily, even if companies like Volkswagen or Fiat might be able to provide this type of dealership network.

In Germany, the large manufacturers have considerably more dealers than the small companies. But there are also major differences in the size and capacity of the individual dealerships. As a rule, German dealers are franchise dealers offering both sales and repair service. The repair service market in Germany, as in other European countries, is dominated by the franchise dealers, who handle an estimated 90 per cent of all mechanical repair work on automobiles.

The 1966 dealership and repair network of the most important automobile manufacturers in the German market is shown in the following tabulation:

	Number of Dealers	Cars* per Dealer
Auto Union	788	650
BMW	665	400
Citroen	221	280
DAF	258	40
Daimler-Benz	604	1, 400
Fiat	1, 035	350
Ford	1, 756	700
Glas	769	300
NSU	1, 113	170
Opel	2, 153	850
Renault	900	270
Volkswagen	1, 917	1, 800
Volvo	78	56

* Total number of cars in operation.

In numbers of dealers, as well as in the quality and capacity of these dealers, Volkswagen, Opel, and Ford enjoy a significant advantage over their competitors. But in terms of economies of scale, this advantage does not appear to be significant. In the United States, General Motors has more than twice as many dealers as Volkswagen. However, neither the existence of Chrysler nor of Volkswagen is threatened by this fact. The same is true in Germany: the smaller manufacturers like BMW, Citroen, and Renault do not appear handicapped by significantly higher distribution costs. Despite this handicap, all three firms increased their market share between 1965 and 1970.

Technological improvements

Although all European car makers are significantly smaller than the Big Three in the United States, there is no technological gap in automobile engineering. Many observers of the scene feel that in terms of safety and technological improvements the European car makers are world-wide industry leaders.

The European subsidiaries of the American Big Three do not derive competitive advantages from the fact that they can tap the research and development resources from their U. S. parents. The cars manufactured by GM and Ford in Europe are generally considered to be conservatively engineered, and these companies have not played a significant role as technological leaders on the European automotive scene.

As in the United States, the small European producers have done more than their proportionate share of pioneering. Technical innovation has indeed been a most appropriate role for the small producer.

There is no technological gap between large and small European producers. To the contrary: companies such as NSU, BMW, Porsche, and, in former years, Glas and Borgward have generally been considered technological leaders by those in the trade. NSU was the first to develop and introduce the Wankel engine in automobiles. Porsche, employing only 2, 700 employees (but among these are 500 engineers),performs contract development work for Volkswagen, Rolls Royce, Alfa Romeo, and General Motors and reportedly obtains about 20 per cent of its sales from such engineering services. Citroen, the third largest French automobile manufacturer, obtained a major breakthrough in automobile engineering with its DS 19 model in 1956. A similar lead, primarily in automobile safety, is taken by Daimler-Benz, who, with 190, 000 units in 1965, is one of the smaller automobile manufacturers, though a leading producer of trucks.

But it must be realized that the more conservative engineering policies of the large car makers are also caused by the fact that these firms direct their marketing efforts towards the mass market for low-priced automobiles. Apparently, customers in these markets do not "buy" engineering and safety features to the same extent that buyers in the specialty car market do.

As in the United States, parts suppliers in Europe have played an important role in innovation. For example, Bosch pioneered electronically controlled fuel injection for gasoline and Diesel engines, new types of automotive headlamps, and other similar innovations.

Flexibility in a changing environment

There is no record to suggest that the large companies have been less flexible than the small firms in adjusting to changing market demands. Volkswagen was often criticized for being slow to adjust to changes in consumer demand with regard to the styling, comfort, and size of its beetle. But small companies, such as Borgward and NSU, made similar mistakes. Therefore, there is no evidence to suggest that small firms are more flexible than large ones.

Planned obsolescence and model policy

Whereas the large U. S. automobile producers have a policy of dynamic obsolescence and frequent styling changes, both the large and small European manufacturers have been reluctant to apply the same marketing principles. The financial interests of large and small firms do not encourage a policy of rapid styling change. Although Opel and Ford, the European subsidiaries of U. S. firms, have used frequent styling changes as a marketing tool, they have not been able to force this marketing policy on their European competitors. Opel AG has taken a more conservative attitude to its restyling cycles in recent years.

If rapid styling change became an accepted marketing policy in the European automobile industry, small firms would definitely be at a disadvantage, since development and tooling costs caused by model changes would hit smaller producers substantially harder than the larger companies in terms of cost per unit. The costs for developing a new automobile are estimated at about $60 million. These costs could rapidly overtax the financial reserves and capabilities of small firms. A small manufacturer assumes considerable risk with the introduction of each new model. If the new model is not accepted by the consumers, he might not have the financial reserves needed to absorb a major loss. A small automobile producer is always "riding a tiger": the risk of a new model is substantially higher for him than it is for large manufacturers, but his return on investment is smaller, so that his capability to absorb an Edsel and to finance another new model is considerably less. NSU and Audi lost their independence primarily because they could not finance a major model change which was necessary to maintain their market share in the face of changing consumer demands.

Future developments

Imports from non-European countries have not yet reached significant levels. Imported automobiles from the United States are, because of major differences in engineering, size, and styling, no real competition. Japanese cars have until now not penetrated the European market. However, the Japanese have demonstrated in the United States that they are willing and able to compete with U. S. and European manu-

facturers. And the success of Japanese automobiles in Switzerland, Europe's traditional international testing ground for cars, indicates that the Japanese have learned how to style, engineer, produce, and sell cars for the European market and that they are serious potential competitors. The threat of Japanese competition is a reality for European car manufacturers, although the Japanese will need several years to build a sales and service network.

Another factor that will undoubtedly influence the further development of the automobile industry is the increasing market saturation. The car population in the industrialized countries -- primarily France, England, and Germany -- has reached a relatively high level with 200 cars per 1,000 people. This means that in the future the automobile industry will have to look for ways to develop the two-car-family market and to induce first-hand owners to trade sooner for new cars. This might, as it has in the United States, mean an increasing trend toward model proliferation and more frequent styling changes. This again will alter the competitive climate, changing the "rules of the game" and increasing the business risk and capital requirements for small and medium-size firms. This, in turn, might result in further concentration, caused not by the need for higher output to obtain cost efficiency, but rather by the need to provide access to the necessary capital and to spread the risk of the business over a broader line of models.

But under present conditions -- and under those foreseeable for the 1970s -- most European automobile manufacturers are large enough to obtain adequate economies of size and to exploit the market potential in the European market.

WORKING PAPERS

1. Sidney C. Sufrin, "Reflections on Evolving Competitive Aspects in Major Industries," Oct. 1969, 74 pages.

2. M. Lynn Spruill, "A Scoring System to Aid in Evaluating a Large Number of Proposed Public Works Projects by a Federal Agency," Oct. 1969, 17 pages.

3. John D. Ludlow, "The Delphi Method: A Systems Approach to the Utilization of Experts in Technological and Environmental Forecasting," Mar. 1970, 52 pages.

4.* Claude R. Martin, "What Consumers of Fashion Want to Know," June 1970, 20 pages.

5.* Sidney C. Sufrin, H. Paul Root, Roger L. Wright, and Fred R. Kaen, "Performance Issues of the Automobile Industry," Sept. 1970, 186 pages.

6. James R. Taylor, "Management Experience with Applications of Multidimensional Scaling Methods," Sept. 1970, 27 pages.

7.* Daryl Winn, "Profitability and Industry Concentration," Sept. 1970, 102 pages.

8.* Joseph W. Newman and Richard Staelin, "Why Differences in Buying Time? A Multivariate Approach," Oct. 1970, 20 pages.

9.* Claude R. Martin, "The Contribution of the Professional Buyer to the Success or Failure of a Store," Oct. 1970, 20 pages.

---

* Copies are no longer available.

10. James R. Taylor, "An Empirical Comparison of Similarity and Preference Judgments in a Unidimensional Context," Oct. 1970, 44 pages.

11.* H. O. Helmers, "A Marketing Rationale for the Distribution of Automobiles," Nov. 1970, 115 pages.

12. Merwin H. Waterman, "Global Capital Markets," Nov. 1970, 35 pages.

13. Claude R. Martin, "The Theory of Double Jeopardy and Its Contribution to Understanding Consumer Behavior," Nov. 1970, 27 pages.

14. Patricia Braden and H. Paul Root, "A Study of the Sources and Uses of Information in the Development of Minority Enterprise--A Proposal for Research on Entrepreneurship," Dec. 1970, 28 pages.

15. Andrew M. McCosh, "Program Auditing," Dec. 1970, 21 pages.

16. Kenneth O. Cogger, "Time Series Forecasting Procedures for an Economic Simulation Model," Dec. 1970, 36 pages.

17. James T. Godfrey and W. Allen Spivey, "Models for Cash Flow Estimation in Capital Budgeting," Dec. 1970, 33 pages.

18. W. Allen Spivey, "Optimization in Complex Management Systems," Dec. 1970, 27 pages.

19. Claude R. Martin, "Support for Women's Lib: Management Performance," Jan. 1971, 19 pages.

20. Donald G. Simonson, "Innovations in the Economics of Project Investment," Jan. 1971, 57 pages.

21. Donn C. Achtenberg and William J. Wrobleski, "Corporate Financial Modeling: Systems Analysis in Action," Jan. 1971, 26 pages.

---

* Copies are no longer available.

22.* John D. Ludlow, "Sea Grant Delphi Exercises: Techniques for Utilizing Informed Judgments of a Multidisciplinary Team of Researchers," Jan. 1971, 84 pages.

23. Ross Wilhelm, "The Spanish in Nova Scotia in the XVI Century--A Hint in the Oak Island Treasure Mystery," Feb. 1971, 40 pages.

24.* Charles N. Davisson and Herbert F. Taggart, "Financial and Operating Characteristics of Automobile Dealers and the Franchise System," Feb. 1971, 243 pages.

25. H. Paul Root, "Market Power, Product Planning, and Motivation," Feb. 1971, 22 pages.

26. H. Paul Root and Horst Sylvester, "Competition and Consumer Alternatives," Feb. 1971, 21 pages.

27.* Dick A. Leabo, "Stepwise Regression Analysis Applied to Regional Economic Research," Feb. 1971, 20 pages.

28. M. J. Karson and W. J. Wrobleski, "Some New Statistical Methods for Analyzing Incomplete Brand Preference Data," Mar. 1971, 25 pages.

29.* Thomas C. Kinnear and James R. Taylor, "Multivariate Methods in Marketing Research: A Further Attempt at Classification," Mar. 1971, 11 pages.

30. W. Allen Spivey, "A Deductive Approach to Linear Optimization," Mar. 1971, 74 pages.

31. Neal Campbell and Cyrus K. Motlagh, "A Stochastic Model of the National Political System in the United States," Mar. 1971, 39 pages.

32. H. Paul Root, "Implementation of Risk Analysis Models for the Management of Product Innovation," Mar. 1971, 62 pages.

---

* Copies are no longer available.

33. William K. Hall, "The Utilization of Linear Optimization Models in Adaptive Planning and Control," Mar. 1971, 21 pages.

34. William K. Hall, "The Determination of Optimal Customer Selection and Allocation Policies for Finite Queues in Parallel," Mar. 1971, 22 pages.

35. John D. Ludlow and Patricia L. Braden, "Socioeconomic Development in the Grand Traverse Bay Area," Apr. 1971, 59 pages.

36. Cyrus K. Motlagh, "Evaluations of Input-Output Analysis as a Tool for the Study of Economic Structure of the Grand Traverse Bay Area," Apr. 1971, 30 pages.

37. Raymond E. Hill and Edgar A. Pessemier, "Multidimensional and Unidimensional Metric Scaling of Preference for Job Descriptions," Apr. 1971, 60 pages.

38. H. Paul Root and J.E. Klompmaker, "A Microanalytic Sales Forecasting Model for New Industrial Products," Apr. 1971, 41 pages.

---

* Copies are no longer available.